

Eye Movement Desensitization and Reprocessing with Body-Oriented Interventions within the field of adoption: Translating neuroscience into a clinical case study.

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Abstract

This article describes the positive effects of a trauma-based approach with an adopted adolescent girl, diagnosed with Somatic Symptom Disorder (SSD). Although symptoms seemed at first sight trauma-unrelated, exploration of her pre- and post-adoption history revealed that re-activated early life adversities (ELA) probably played a crucial role in the development of her condition. In this case study, we describe in depth the content of the trauma-focused sessions, using different forms of Eye Movement Desensitization and Reprocessing (EMDR) and body-oriented exercises, as well as the theoretical rationale behind the clinical interventions.

This case study aims to support clinicians in the treatment of children who must deal with the sequelae of early traumatic events, by illustrating how the current neuroscientific knowledge on brain development and trauma can be used during the diagnostic and therapeutic process.

Key words: Eye Movement Desensitization and Reprocessing (EMDR), storytelling, psychological trauma, adoption, yoga, neurobiology

In a child psychiatric setting, we often meet children who have experienced (single or complex) stressful events. However, these children / youngsters often do not meet the criteria of a Post-Traumatic Stress Disorder (PTSD) – as described in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5: American Psychiatric Association, 2013: 5th ed.). This is not surprising since the validity of the criteria for children (older than 6 years) and adolescents has not yet been properly established. Except for the inclusion of a PTSD pre-school sub-type (younger than 6 years) no developmental adaptations of the symptom criteria have been made. Furthermore, this diagnosis seems to relate to the impact of acute single case trauma and to a much lesser extent to the sequelae of chronic (inter-personal) trauma.

It has been well-established that the manifestation of traumatic stress in children and youngsters is influenced by developmental, as well as environmental elements. Hence, children's symptoms do not simply parallel those of adults (Adler-Tapia & Settle, 2009; Beer & de Roos, 2017). The trauma response at younger ages is often multi-faceted and masked by other clinical presentations, especially in case of chronic (long-term) traumatic exposure. Due to this diagnostic reality, the link between children's mental health problems and past traumatic experiences often goes unnoticed, resulting in a treatment that is not trauma-focused (Cloitre *et al.*, 2009; Cook *et al.*, 2005; Spinazzola *et al.*, 2011).

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In this article, we look at a specific group of children often with a history of chronic traumatic exposure: adopted children. Some of these children's self-regulatory capacities are extremely impaired, which is considered a core characteristic of childhood adversity (Cook *et al.*, 2005; van der Kolk, 2005; D'Andrea *et al.*, 2012). The negative impact of chronic interpersonal traumatization – in general, as well as specifically in the context of institutionalization – on brain development and later mental health has been well established (Perry, 2009; Sheridan *et al.*, 2012; Zeanah *et al.*, 2003). However, there is also a group, who have less severe or clear-cut problems (e.g. somatic complaints, sleeping problems, alexithymia, etc.). Could it be possible that these children's current symptoms are associated with their pre-adoption experiences?

The goal of this article is to demonstrate that it is worthwhile to explore whether (adoptive) children's broad range of symptoms might positively be influenced by a treatment that focuses on potential pre-adoption traumatic experiences. This idea is based on the hypothesis that the separation from the biological mother and any early residential group care, even if of a good (enough) quality and for a relatively short period of time, are significantly stressful events that can leave a neurobiological imprint, especially when these occur early on in life.

We present the case of an adopted girl. Firstly, her symptoms and history are described. To explain the potential benefits of trauma-based interventions, even in the absence of a trauma-related diagnosis, we link the reported and observed symptoms to these early life experiences. Secondly, and most importantly, we describe in detail the therapeutic process, using various interventions. The primary focus is on Eye Movement Desensitization and Reprocessing (EMDR), next to body-oriented exercises. By describing the sessions in detail, we hope to contribute to the therapeutic knowledge about the use of EMDR with children and youngsters in general, as well as specifically with adopted children.

Case Description: Somatic complaints in a girl with an adoption history

Presentation

Yin-Lee (whose name and identifying information have been changed to protect her anonymity), was a 15-year-old, adopted girl, who was referred to the first author with medically unexplained somatic problems. Prior to the referral to our outpatient unit, she had been hospitalized for one month, undergoing psychological, as well as medical, tests. The symptoms that she presented with – during her hospitalization (as well as at the time of her referral) – were the following: fatigue/tiredness (sleeping during the day and going to bed early); lack of energy; walking very slowly; delayed thinking and responding; soft speech; minor memory problems; lapses in concentration; headaches and abdominal pain. This symptomatology started in January of the year following the summer that

Yin-Lee and her adoptive family had visited her country of origin. Her parents had reported some allergies and respiratory problems during childhood, as well as recurrent gastro-intestinal problems.

Before the visit, Yin-Lee had been very adventurous and active. She had excellent academic grades and was a socially competent youngster. However, due to her current state, she was unable to attend school full-time and she had to give up her hobbies (swimming, cycling, surfing). She also became more socially isolated.

Based on the findings from the hospitalization, she was diagnosed with a Somatic Symptom Disorder (SSD). This disorder is characterized by somatic symptoms that are either very distressing or result in significant disruption of functioning (Criterion A), as well as excessive and disproportionate thoughts, feelings and behaviours regarding those symptoms (Criterion B). To be diagnosed with SSD, the individual must be persistently symptomatic (Criterion C) (typically at least for 6 months) (APA, 2013).

Client History

About one and a half months after her birth, Yin-Lee's biological mother abandoned her. After that, she spent the first year(s) of her life in a small orphanage with relatively good care (enough food, good hygiene, small groups, fixed caregivers, etc.). The caretakers of the orphanage described Yin-Lee as being an intelligent and obedient toddler.

Yin-Lee was adopted at the age of 22 months. When she was handed over to her adoptive parents, she first cried and then clung to her (new) mother. For the following eight months, Yin-Lee stayed at home with her mother. After this period, she had to go to day-care. She became very upset each time that she was dropped off. This was also the case whenever her mother had to go out. For the first six months after arriving in her adoptive family, she had sleeping problems. Except for the toilet training (mainly at night), Yin-Lee showed no other developmental problems. Going to kindergarten (after day-care) went well, only Yin-Lee seemed bored. An intelligence test showed she was cognitively very talented.

Yin-Lee's parents described her as an easy-going child and youngster. However, they were often 'in the dark' about how she really felt. At the age of four years, Yin-Lee's parents adopted a younger sister, with whom she has no biological tie.

Linking the Body and Developmental Tasks to Early Life Experiences

In the following paragraphs, we will discuss why we considered Yin-Lee's symptoms as trauma-related, and why we chose to use trauma-oriented interventions. The goal was not to question the diagnosis, but to analyze the symptoms from a different angle.

We hypothesized that the visit to Yin-Lee's country of origin, especially to the place where her biological mother had left her to be found, had triggered Yin-Lee back into her early (pre-adoption)

life experiences. The lethargic state (hypo-arousal) in which she was at the time of the psychiatric consultation, probably reflected the physiological response (freeze-state) that she experienced during the pre-adoption period. Research has shown that young children are more likely to use a dissociative response when confronted with threat (i.e. freeze and surrender) (Perry *et al.*, 1995). Given the limited skills (e.g. verbal, motor) at this very early age, fight or flight responses are not a realistic option, and so the child finally becomes immobile, utilising the freeze response (Levine & Kline, 2007).

While talking with Yin-Lee, we noticed that she had the strong tendency to think logically and linearly, and be less intuitive and emotional. Her ability to connect to her internal states, feelings, wishes and needs seemed reduced. On a neurobiological level, it seemed that the left hemisphere dominated the right one, which exchanges information with the lower or subcortical regions of the brain (brainstem, limbic regions) and the body (Siegel, 2012; Siegel & Bryson, 2012). This lack of integration between the self and the body is often observed in victims of traumatic experiences (West *et al.*, 2017). Since trauma is held in the body, somatic symptoms like Yin-Lee's are frequently found among traumatized individuals (Lamers-Winkelmann, *et al.*, 2012; van der Kolk, 2014; West *et al.*, 2017).

Yin-Lee's adoptive parents also reported that their daughter still depended strongly on them, especially on the mother (e.g. choosing her clothes), and sometimes showed age-inappropriate behaviour (e.g. climbing on her father's lap during the consultation, aged 15). She barely showed any teenager specific behaviour (e.g. orientation towards peers). From a developmental perspective, moving towards independence is a central theme in adolescence. We hypothesized that this developmental task had been compromised by earlier unresolved or traumatic separation processes: in Yin-Lee's case, the separation from her biological mother and a second separation from the foster home. As described in the section *client history*, separation from her adoptive mother had often evoked anxiety in the past.

Trauma-based Treatment

Based on the hypothesis that Yin-Lee's symptoms were trauma-related, we concluded that her treatment should be trauma-focused. We followed the Expert Consensus Guidelines for Complex PTSD (in Adults) of the International Society for Traumatic Stress Studies (ISTSS), in which a three-stage model is recommended (Cloitre *et al.*, 2011, 2012). Central to the first phase is the development of arousal, emotion regulation and social skills. The goal of the second phase is to integrate the traumatic material. Traumatic memories are not merely reactivated, but a reappraisal of the meaning of the experiences also takes place, transforming them (hopefully) into a much more positive and coherent conscious narrative, which then becomes part of the client's personal history. In the third phase, patients learn how to deal with stress in the future and are encouraged to experiment with new

behaviours in everyday life, as well as to apply skills to strengthen safe and supportive relationships with others (Cloitre, 2012; Gelinias, 2003).

In the following part, we will describe in detail what the different treatment phases in our case study looked like. A total of seventeen individual sessions (45-60 minutes), including two follow-up sessions (three and six months later), and three additional sessions with the parents, all took place at the outpatient child psychiatric unit of the hospital.

First Phase: Yoga & interoceptive awareness

Keeping Yin-Lee's symptoms in mind, we introduced body-oriented exercises to increase her ability to feel the activity of the interior self, i.e. interoceptive awareness, as well as her energy level (i.e. changing her current physiological state of hypo-arousal) (Emerson, 2015).

According to the phase-based treatment model, the modulation of the arousal level is central to trauma treatment and should proceed memory processing (Cloitre *et al.*, 2011).

Processing is only possible within a range of optimal arousal states, during which one can both think and feel, also known as the 'window of tolerance' (Ogden, Minton & Pain, 2006; Siegel, 2012). The ability to connect to the body is also relevant for the second phase since the client is then asked to identify the location of body sensations in relation to the traumatic memory (EMDR assessment phase). Heightened somatic awareness also enhances mind-body integration during processing.

To increase Yin-Lee's interoceptive capacity and energy level at the same time, we encouraged her to perform yoga postures that help to convey a sense of strength, counterbalancing her lethargic state (e.g. Mountain Pose, Warrior Pose II) and invited her to notice the impact of the different postures on her body by asking the following open question: "*What sensations do you notice in your body?*". As Emerson describes in his (2015) book on Trauma Sensitive Yoga, *notice* (or awareness) is the most important interoceptive word. The focus is on physical sensations, the language of the primitive reptilian brain, which plays an important role in trauma. By performing the postures with the therapist, feelings of interpersonal connection are positively influenced (Macy, Jones, Graham & Roach, 2018).

To further counteract the observed level of immobilization, we introduced Yin-Lee to Hatha Yoga Sun Salutations. A Sun Salutation encompasses 12 purposeful movements that help the person becoming more centred in the present. The repetitive character of the Sun Salutations can help to restore the rhythmicity of biological functions that often become disrupted in case of trauma (Brown & Gerbarg, 2009; van der Kolk, 2014). Furthermore, research has shown that yoga can reduce somatic symptoms, in general, and gastrointestinal problems in adolescents specifically (Kuttner *et al.*, 2006; Woodyard, 2011).

Since trauma is characterized by an imbalance of the stress-response system, we also introduced yoga breathing, called 'pranayama'. The breath is the only autonomic function that can be

manipulated through conscious effort. Voluntarily regulated yoga breathing serves as the gateway through which the stress-response system (autonomic nervous system), metabolism, higher brain functions and mental state can be influenced (Brown & Gerbarg, 2009; Telles & Singh, 2013). Practiced by both client and therapist, these practices enhance present-moment-awareness in both participants, which improves the reciprocal attunement (Geller & Porges, 2014). We also practiced alternate nostril breathing, since this type of cyclical breathing supposedly synchronizes different areas of the brain and improves interhemispheric communication (Brown & Gerbarg, 2009).

A second element of this first phase was the implementation of a specific EMDR protocol: Resource Development and Installation (RDI) developed by Korn & Leeds (2002). This procedure, which is part of the Preparation Phase of the EMDR-protocol, is used to strengthen connections to positive memories, images and symbols and to enhance emotional resilience and coping skills (Adler-tapia & Seattle, 2009). From a list of positive memories, Yin-Lee picked out (memories of) special moments with her friends, as well as with her family, when she felt strongly connected to them. These ‘Relational Resources’ represented safe places that counterbalanced the sense of abandonment that Yin-Lee must probably have felt as a baby and that corresponded to the primary relationships of the two developmental stages that would be addressed: early childhood (parental attachment figures) and adolescence (peers). In Table 1, an overview is given of all the necessary elements.

Table 1: Identification of Relational Resources and accompanying elements.

Relational Resources	Image	Cognition	Emotions	Sensations
Sport camp with friends	Kayak on the river with friends – a friend falls in the water	I am loved	Powerful Happy / Cheerful	Strength in legs Flow in upper body
Parents reading a bedtime story	Together with mother in her bed reading a bedtime story	I am loved	Happy	Relaxed body

Second Phase: *Eye Movement Desensitization and Reprocessing (EMDR)*

There are different ways to integrate traumatic memories. In this case, EMDR, an evidence-based psychotherapeutic approach, was used. This integrative methodology was originally designed to treat post-traumatic stress but over the years the therapeutic scope has grown and a broad range of clinical issues are now effectively addressed by EMDR therapy. Central to the treatment is the processing of distressing memories of past experiences. These are considered to lie at the root of the client’s difficulties (Hase *et al.*, 2017). This assumption is the core of the Adaptive Information Processing model (AIP), that guides EMDR practice (Shapiro & Lalotitis, 2011). According to this unique theoretical model, everyone has a natural information processing system that assimilates new

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information by linking current perceptions to relevant stored information and. When confronted with stressful experiences, it generally progresses towards adaptive resolution (integration). However, when the level of arousal is overwhelming, the event becomes stored in a maladaptive (raw/state-specific/unprocessed) form and no connection is made with other memory networks that hold adaptive information (i.e. isolated form) (Adler-tapia & Settle, 2009; Hase *et al.*, 2017; Solomon & Shapiro, 2008). By means of standardized procedures and protocols within EMDR, the dysfunctionally-stored traumatic memory can become linked to more adaptive information in other memory networks. Hence, information-(re)processing becomes facilitated.

The EMDR-protocol consists of eight phases. In the first two phases, the therapist evaluates whether the client is ready for treatment (by giving psycho-education, identifying targets, developing skills to deal with the intensity of the treatment), which corresponds with the first phase of trauma treatment. In the third phase, all traumatic memories (called 'targets') are identified and mapped out in a structured way (the most distressing part/image, irrational and desired beliefs/cognitions, emotions, sensations). While all these aspects of the person's memory are accessed, the client simultaneously focuses on a form of dual attention stimulation, such as bilateral eye movements, tones, or hand taps. After each set of bilateral stimulations, the client is invited to "*notice what happens next*", to elicit further information.

The actual internal memory-processing occurs in phases four to six, when the therapist asks the client to focus on the different components and the bilateral stimulation starts. In phase seven, the therapist makes sure the client can leave the session in a relatively relaxed state and, in phase eight, he/she evaluates whether the positive results of the previous session have been preserved. In the following paragraphs, we will focus on the content of the third phase, which is the most important one.

To identify all relevant targets, we used the timeline that Yin-Lee had drawn up previously (which included positive, as well as negative memories). Three different targets connected to her adoption history, were selected: the order of processing these was determined by the degree of distress, when thinking about these traumatic experiences. The most recent experience presented itself as the one which was affecting Yin-Lee the most, in the sense that she could connect with it the best (as a mind-body unit, and not just in a rational way). We implemented the 'Inverted Standard Protocol' (Hofmann, 2009) and we worked our way through her life story, starting with the most recent experience, which then worked as a lever to access the pre-verbal targets that seemed to be buried deep inside.

The following "hot spots" were considered consecutively: (a) visiting the location where she was left behind as a baby. We then moved on to: (b) a photograph that was taken of her as a toddler in the orphanage. This trauma-related visual stimulus had an intense emotional charge for Yin-Lee,

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since it reflected how sad she had felt at the time: (c) finally, we used the story-telling method to create a structured life narrative. ‘EMDR-storytelling’ is a method developed by Lovett (1999) to process pre-verbal traumatic memories.

This approach enabled Yin-Lee to process what she experienced during the first years of her (pre-adoption) life. We also hypothesized that the storytelling would improve Yin-Lee’s sense of self across time (memory integration) – since she described the absence of a connection between her (early) past and present – as well as the collaboration between both hemispheres: a narrative implies the left hemisphere for the linear telling, and the right hemisphere to make sense of (autobiographical) experiences (Siegel, 2012). A description of the actual narrative will be given in the following paragraphs.

For the processing of the first two targets (a) and (b), we used the standard protocol: In Table 2, a description is given of all the imperative ingredients. As a child, Yin-Lee had a lot of respiratory difficulties, which might explain the focus on these body parts during the assessment and processing.

Table 2: Identification of targets and accompanying elements.

Target	Image	Cognitions	Emotions	Sensations
Visit to home country	Looking behind a gate to the stairway where she was left by her biological mother	NC: I am alone PC: I am part of a nice family	Sadness / relief	Cold / chest / throat
Orphanage	Photograph of her with sad face taken in orphanage	NC: I am alone and can’t escape PC: I am rescued and connected	Sadness	Something hard in chest

Note: NC = Negative Cognition. PC = Positive Cognition.

The starting point for the narrative (c), was the autobiography that Yin-Lee had written as a school assignment, which provided a chronological structure. To create a more detailed story, which included not only facts, but also emotions, we discussed each paragraph with the intention of exploring Yin-Lee’s feelings and sensations. Since she only remembered her early childhood partially, we used her adoptive parents as therapeutic ‘partners’ and asked them to write down Yin-Lee’s life-story, based on the (medical and adoption) documents that they had received and on their own observations (information regarding their daughter’s pre-adoption life, her first reaction upon meeting them, and other significant behaviours later in life).

Written feedback was given by the first author. Both documents were integrated and infused with all the structural EMDR-elements. The story, written in the third person, started with a positive introduction in which Yin-Lee could recognize herself. In the middle section, a description was given

of the traumatic events with a strong emphasis on the sensorimotor perceptions, i.e. those between birth and through age 2 (Piaget, 1936), since this type of input defines a child's experience at a pre-verbal age. The final part included positive cognitions in the present and towards the future (Beer & de Roos, 2017).

Although the parents had written the story, we somehow doubted whether they should be present during the actual processing sessions, since we also needed to consider Yin-Lee's separation process and autonomy. However, we concluded that this developmental goal could only be reached if Yin-Lee could fully trust, on a visceral level, that a permanent connection (attachment) had been established between her and her adoptive parents. Their physical presence counterbalanced the parental absence and the sense of abandonment that she probably experienced during the first years of life. Before reading the story, we planned an individual session with the parents so as to explore whether there were any questions left, but also to make sure they would not get overwhelmed while reading the story.

Third Phase: Focusing on an autonomous self

Since this phase focuses on the future, we were worried about Yin-Lee's ability to become more independent. The storytelling method made it possible to integrate elements of this developmental task at the end of the story in which the main character is oriented towards the future. Developmentally congruent behaviour and age-appropriate relationships were described and linked to her new self (Herman, 1997). Furthermore, plans were made regarding school, hobbies and social activities.

Summary of treatment plan

Trauma treatment: Three-stage model

First Stage: Development of arousal, emotion regulation and social skills

- Yoga postures of strength
- Sun salutations
- Pranayama / breathing exercises
- Resource Development and Installation (RDI) (see Table 1)

Second Stage: Integration of the traumatic material

- EMDR-protocol (8 phases):
 - Phase 1 & 2: psychoeducation and client readiness (= first stage trauma treatment)
 - Phase 3: assessment phase = structured identification of traumatic memories or targets (see Table 2)
 - Inverted Standard Protocol
 - Storytelling
 - Phase 4 – 6 (memory-processing): desensitization, installation, body scan
 - Phase 7: closure (end of session)
 - Phase 8: reevaluation (next session)

Third Stage: Dealing with stress and practicing social and relational skills in the future

EMDR-storytelling (last part)

Future plans regarding school, hobbies and social activities

Post-treatment Results

After treatment, the criteria of Somatic Symptom Disorder (APA, 2013) did no longer apply to Yin-Lee. All of the somatic complaints reported by her and her parents were resolved. Yin-Lee gradually became more active. Both the therapist and Yin-Lee's parents observed an increase in her facial expressions, which made it much easier to attune to her and to understand how she felt.

At a follow-up session three months later, Yin-Lee walked at a normal pace and moved in a dynamic and vigorous way, which had never happened before during her therapy. She fully attended school, without any adjustments to her program. She did not take any naps during the day. She even took the train to her new school and was visibly excited about the change. She was clearly heading towards autonomy. She had also decided to pick up sports again. Her parents said that their original family life had been restored (walking, cycling, going to restaurants in the evening ... etc.). They described their daughter as being much more vibrant. They also said that she expressed feelings of anger and irritation towards them, as well as towards her sister, which had been difficult in the past. The (previously implicit) cognition, that she might lose the love of her parents if she would disagree, had clearly disappeared and she had moved on to a new developmental stage. We jointly decided to end treatment, since the therapeutic goals had been reached. This positive evolution also continued up to six months after the last session.

Discussion

This case study describes the positive effects of EMDR and body-oriented interventions in an adolescent girl, presenting with somatic complaints and a history of adoption. It illustrates how the theoretical knowledge on brain/mind-body development and trauma can be translated and applied to a clinical situation.

This article demonstrates how important it is to consider the impact of negative experiences during childhood even when the symptoms of the client seem (at first sight) trauma-unrelated. Detecting trauma-related symptoms in children/youngsters – and treating them properly – is highly important in terms of public health. Childhood trauma has a high co-morbidity rate, especially in case of chronic trauma, and is considered a risk factor for psychopathology later in life (Jonkman *et al.*, 2013; Meiser-Stedman, 2002; Perry, 2008; van der Kolk, 2014). Treating trauma at an age where the brain is still growing therefore can have a positive influence on adult psychopathology (Cloitre *et al.*, 2009).

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To date, three meta-analyses explored the existing empirical evidence for EMDR as an efficient way to treat trauma-associated symptoms in children and adolescents (Brown *et al.*, 2017; Moreno-Alcázar *et al.*, 2017; Rodenburg *et al.*, 2009). Although the results are not yet conclusive, they point in a positive direction and practice-based guidelines do mention EMDR as a potential treatment (Potgieter-Marks, Struik & Sabau, 2017).

In this case study, different EMDR-protocols were combined. This shows that not only the standard protocol, but also developmentally-appropriate approaches like storytelling, might be promising. Although this protocol is used for children between zero and four years old, it can also be implemented with older children who are pre-verbally traumatized (de Roos & Beer, 2017). This specific format has the advantage of integrating past, present and future at the same time, which is especially useful for adopted and/or foster children/youngsters since it creates the possibility of reconstructing their life history, which enhances self-understanding (Siegel & Bryson, 2012).

As we already know, treating the effects of trauma on the body has a positive effect on emotional and cognitive processing (Ogden *et al.*, 2006; Ogden & Fisher, 2015; van der Kolk, 2006), this case-study shows how somatic interventions can be integrated with other methodologies. In case of extreme dysregulation, we assume that an even more extensive, as well as intensive body-oriented phase than the one described in this case-study, needs to precede the EMDR-part of the 'treatment'. The better that one can self-regulate, the better one's ability is to engage in an effective way in well-established trauma-treatments (Corrigan, Fisher & Nutt, 2011). Regarding the yoga interventions (pranayama, as well as the asanas) used here, we want to emphasize that a regular practice, integrated into daily life, will enhance the favourable effects.

Finally, we paid particular attention to a specific population: adopted children & youngsters. Although a lot has been written about how these children function after they have been adopted, literature on how to treat them is less voluminous. We certainly do not want to become overly confident, but we are convinced that it is worthwhile to implement the treatment procedure that we described with other adopted or foster children. However, we should consider the diversity in this population: some of these children suffer from severe attachment issues. In case of attachment trauma, a specific EMDR-protocol has been developed (by Wessermann *et al.*, 2012) to influence positively attachment status in children. However, it is beyond the scope of this article to discuss this approach in depth, or to consider the pros and cons of both adaptations. In summation, it seems that EMDR, possibly combined with other approaches (e.g. body work, family therapy, etc.), offers many possibilities to enhance these children's (and their family's) well-being. Findings from further clinical practice and further research will hopefully reveal which children/youngsters might benefit most from the various EMDR-protocols.

Although case studies are sometimes considered as having limited scientific value, they often add considerable value to clinical practice. The positive practice-based results, obtained in this single-case study, can be an impetus towards further evidence-based research on the potential benefits of this approach (using larger samples and multi-method pre- and post-measurements, including neuro-imaging) to reveal the impacts of trauma on the functioning of the brain.

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